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NAS WHITING FIELD
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FINAL SAMPLING AND ANALYSIS PLAN FOR SITE 38 NAS WHITING FIELD FL
8/3/2001
CH2M HILL

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CH2MHILL
Constructors, Inc.

August 3, 2001

Ms. Linda Martin (Code ES318)
Southern Division, Naval Facilities Engineering Command
P.O. Box 190010
North Charleston, SC 29419-9010

RE: Contract No. N62467-98-D-0095
Contract Task Order 0011 – Naval Air Station (NAS) Whiting Field – Milton, Florida
Final Soil Sampling and Analysis Plan, Site 38 – Former Golf Course Maintenance Building 2877, Revision 01

Dear Ms. Martin:

CH2M HILL Constructors (CCI) is pleased to provide one (1) copy of the Final Soil Sampling and Analysis Plan for Site 38 – Former Golf Course Maintenance Building 2877, NAS Whiting Field, Revision 01.

Please contact me (850.939.8300, ext. 17) if you have any questions or comments regarding this material. We have already received EPA and FDEP approval of the document and do not expect further comments to this version. Please sign the approval page and return to us indicating the Navy's acceptance of this document.

Sincerely,

CH2M HILL

Amy Twitty, P.G.
Project Manager

cc: Mark Shull/NTR NAS Pensacola
Craig Benedikt/EPA
Jim Cason/FDEP (electronic only)
Terry Hansen/TtNUS (electronic only)
Larry Smith/TtNUS (electronic only)
Jim Holland/NASWF (2 copies, one for library)
Phillip Ottinger/TtNUS
CCI Project File No. 151168

Soil Sampling and Analysis Plan
Site 38 - Former Golf Course Maintenance Building 2877

Naval Air Station Whiting Field
Milton, Florida

Revision 01

Contract No. N62467-98-D-0995
Contract Task Order No. 0011

Submitted to:

U.S. Naval Facilities Engineering Command Southern Division

Prepared by:

CH2MHILL
Constructors, Inc.

115 Perimeter Center Place, N.E.
Suite 700
Atlanta, GA 30346

July 2001

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Site 38 - Former Golf Course Maintenance Building 2877

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Prepared by:

CH2MHILL
Constructors, Inc.

July 2001

Prepared/Approved By:

Amy Twitty, P.G., Project Manager — July 31, 2001
Date

Client Acceptance:

Linda A. Martin
U.S. Navy Responsible Authority — 7 Aug 01
Date

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Tables

Figures

Acronym List

bls	below land surface
CCI	CH2M HILL Constructors, Inc.
COC	contaminant of concern
CompQAP	Comprehensive Quality Assurance Plan
EISOPQAM	EPA Region IV Environmental Investigation Standard Operating Procedures and Quality Assurance Manual
EPA	U.S. Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FL-PRO	Florida Petroleum Residual Organic
mg/kg	milligrams per kilogram
µg/L	micrograms per liter
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
PCBs	polychlorinated biphenyls
PPE	personal protective equipment
PRGs	Preliminary Remedial Goals
QA	quality assurance
QC	quality control
RBCs	risk-based concentrations
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan
SCTLs	soil cleanup target levels
SVOCs	semi-volatile organic compounds
TAL	target analyte list
TAT	turnaround time
TRPH	total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
VOCs	volatile organic compounds

1.0 Background

Site 38 is located in the northern portion of Naval Air Station (NAS) Whiting Field, immediately west of the 7th hole fairway on the NASWF Golf Course. Refer to Figure 1-1 for the site location. The site includes the former Building 2877, which was located approximately 276 feet west of the patrol road and 860 feet north of the white lattice fence associated with the pistol firing range. Building 2877 was formerly the golf course maintenance building and used as a storage facility for pesticides and battery reconditioning. A 1-acre area north of the building was used to rinse trucks after they were used to spray pesticides. The pesticides stored in Building 2877 included organophosphates, herbicides, fungicides, chlordane, heptachlor epoxide and some hydrocarbon pesticides. Pesticide storage was discontinued in 1983 after the completion of a new pesticide facility.

Battery acid from golf cart batteries was reportedly drained into a sink inside Building 2877 which in turn drained into a tank that consisted of an underground concrete culvert open at one end. The tank retained approximately 50 gallons of liquid before draining to the subsurface. The tank was filled with rock sometime between 1974 and 1979 and battery acid draining was discontinued. Building 2877 was destroyed in 1993 during an upgrading and reconstruction project at the NAS Whiting Field Golf Course. The concrete building foundation is believed to still be present; however, it is unknown if the former drainage tank is still present (Tetra Tech NUS, Inc. (TtNUS), 2000).

In March 1996, during the Navy's relative risk ranking for the site, Brown & Root Environmental Services, Inc. collected a single surface soil sample (0 to1-foot sample depth) at Site 38. The soil sample was analyzed for the target compound list volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs) and target analyte list (TAL) inorganics. No organic compounds were detected above analytical method detection limits.

In May 2000, TtNUS collected 19 surface soil samples (38SS01 through 38SS19) and 9 subsurface soil samples (38SB10 through 38SB19) during the Remedial Investigation/Feasibility Study (RI/FS) of Site 38. Surface soil samples were collected from 0 to 1 foot below land surface (bls) and subsurface soil samples were collected from 8 to 11 feet bls. The subsurface soil samples exhibited concentrations of various metals which were all below the associated U.S. Environmental Protection Agency (EPA) and Florida Department of Environmental Protection (FDEP) residential and industrial Soil Cleanup Target Levels (SCTLs) from Chapter 62-777 of the Florida Administrative Code (FAC) except vanadium, which was above the FDEP residential but below industrial direct exposure in two samples collected at locations below 8 feet bls.

The surface soil samples exhibited concentrations of various pesticides, metals and total recoverable petroleum hydrocarbons (TRPHs). EPA Region IV Risk Assessment Guidance Recommended Ecological Screening Values were exceeded in six locations. However, samples from only two locations, 38SS11 and 38SS12, exceeded either FDEP SCTLs for residential direct exposure, FDEP leachability standards, or USEPA Region IX residential

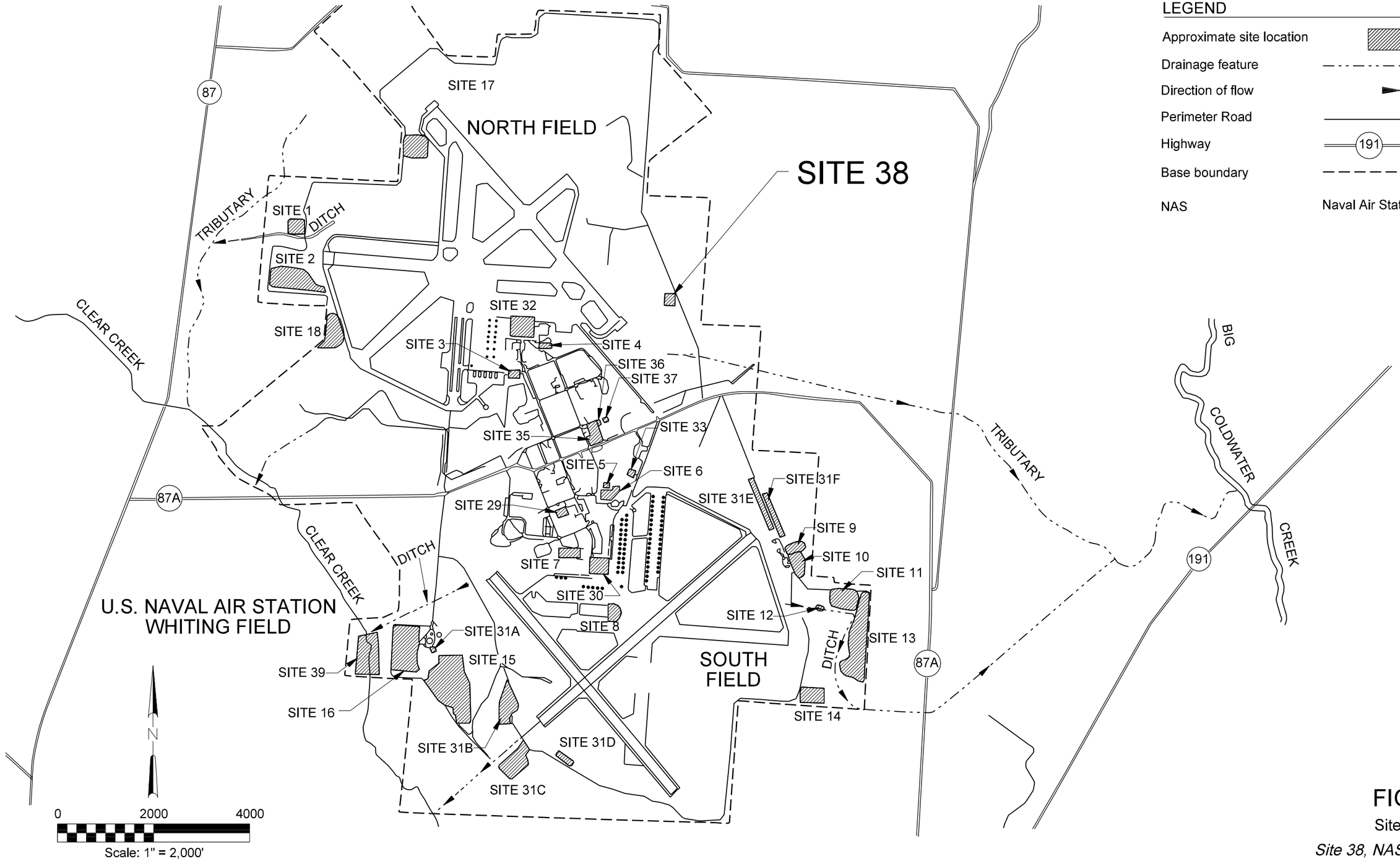

FIGURE 1-1

Site Location Map

Site 38, NAS Whiting Field

Preliminary Remedial Goals (PRGs). Surface soil sample 38SS11/38SS11D exhibited pesticide concentrations of 4,4'-DDE and 4,4'-DDT above the EPA Region IV recommended ecological screening values and alpha-Chlordane, gamma-Chlordane, and heptachlor epoxide above the FDEP SCTLs and EPA Region IX PRGs for residential direct exposure. The TRPH concentration in sample 38SS11D also exceeded the FDEP leachability and direct exposure residential standards.

Surface soil sample 38SS12 exhibited concentrations of 4,4'-DDE, 4,4'-DDT and dieldrin above EPA Region IV ecological screening values and also the PRG residential standard for both dieldrin and heptachlor epoxide. Surface soil samples 38SS13, 38SS14, 38SS15 and 38SS16 were collected following the 38SS11/38SS11D and 38SS12 sampling event. These sample results were below regulatory guidelines. Soil sample results for 38SS11 and 38SS12 are listed in Table 1-1. Refer to Figure 1-2 for the RI/FS surface and subsurface soil sample locations and results.

Preliminary discussions with TtNUS personnel have indicated the ecological screening value exceedances have been determined (through risk assessments) to not pose an ecological risk and therefore, sample locations with ecological screening value exceedances (other than 38SS11 and 38SS12) will not be further investigated.

TABLE 1-1
Soil Sampling Analytical Results
Site 38, Whiting Field NAS

Compound	Regulatory Guidelines			Soil Sample Location		
	FDEP SCTLs Residential/ Industrial/ Leachability	**USEPA Region IX PRG Residential/ Industrial**	**USEPA Region IV Ecological Screening Values**	**38SS11 (0-1')**	**38SS11D (0-1')**	**38SS12 (0-1')**
Pesticides (mg/kg)						
4,4'-DDE	3.3/13/18	1.7/12	0.0025	**0.446 J**	**0.402 J**	**0.148**
4,4'-DDT	3.3/13/11	1.7/12	0.0025	**0.517 J**	**0.468 J**	**0.116 J**
alpha-Chlordane	3.1/12/9.6	1.6/11	NA	**5.72 J**	**5.46 J**	0.929 J
Dieldrin	0.07/0.3/0.004	0.03/0.15	0.0005	**--**	**--**	**0.035 J**
gamma-Chlordane	3.1/12/9.6	1.6/11	NA	**4.55**	**4.26**	0.649
Heptachlor Epoxide	0.1/0.4/0.6	.053/0.27	NA	--	**0.194 J**	**0.097**
TRPH (mg/kg)	340/2500/340	NA/NA	NA	321	**479**	27.8

Notes:
Soil sample concentrations exceeding industrial guidelines are in **bold**.
USEPA = United States Environmental Protection Agency
PRG = Preliminary Remedial Goal
SCTLs = Soil Cleaning Target Levels
SS = Surface Soil Sample
mg/kg = milligrams per kilogram
-- = analyte not detected
TRPH = Total Recoverable Petroleum Hydrocarbons
J = Indicates the presence of a chemical at an estimated concentration.
NA = Not Available

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RI surface soil sample and designation — 38SS01 ▲

Notes:

1. All units are mg/kg.
2. TRPH = Total Recoverable Petroleum Hydrocarbons
3. The applicable residential/industrial soil criteria for Site 38 are:

	EPA PRG	FDEP SCTL	EPA ESV
alpha-Chlordane	1.6/11	3.1/12	NA
gamma-Chlordane	1.6/11	3.1/12	NA
4,4'-DDE	1.7/12	3.3/13	0.0025
4,4'-DDT	1.7/12	3.3/13	0.0025
Dieldrin	0.03/0.15	0.07/0.3	0.0005
Heptachlor Epoxide	0.053/0.27	0.1/0.4	NA
TRPH	NA/NA	340/2500	NA

4. PRG = EPA Region IX Preliminary Remedial Goal
5. SCTL = Soil Cleanup Target Level
6. ESV = EPA Region IV Recommended Ecological Screening Value
7. NA = Not Available
8. NE = No exceedance of applicable criteria
9. J = Estimated Value

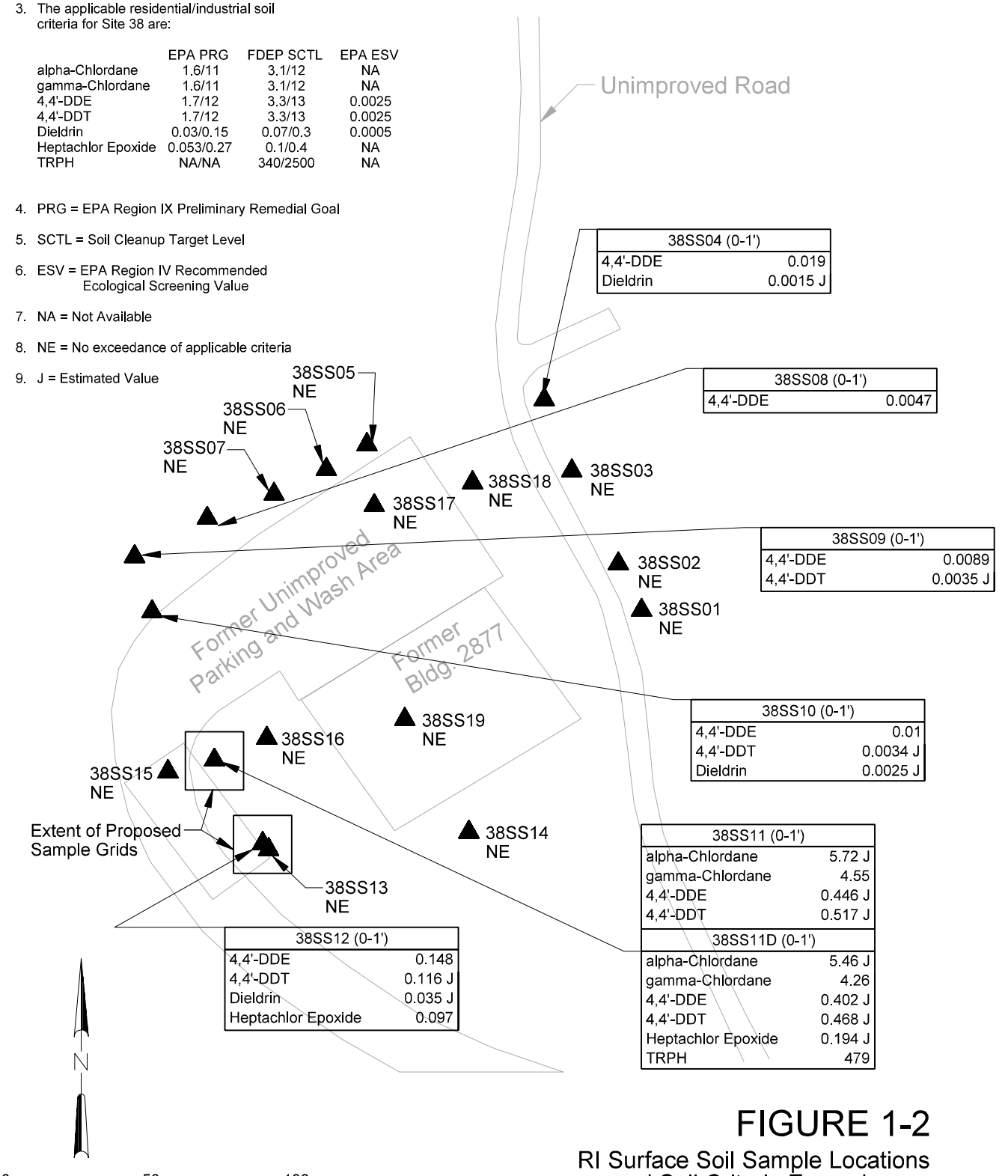

FIGURE 1-2

RI Surface Soil Sample Locations and Soil Criteria Exceedances

Site 38, NAS Whiting Field

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2.0 Summary of Work

This work will consist of surface soil sampling at Site 38 to delineate the extent of the contaminants of concern (COCs), which include pesticide and TRPH constituents in surface soil in the vicinity of RI/FS samples 38SS11 and 38SS12.

2.1 Health and Safety

Health and safety hazards are associated with work to be performed under this contract. Therefore, work is anticipated to be conducted in Level D personal protective equipment (PPE), with provisions to upgrade to Level C protection as specified in the Basewide Health and Safety Plan (CCI, 1999).

2.2. Soil Investigation

A minimum of 20 surface soil samples (plus associated quality assurance/quality control [QA/QC] samples) will be collected in the vicinities of sample 38SS11 and 38SS12, for the source delineation of the COCs. A 20-foot by 20-foot sampling grid will be set up around the location of each original sample (as identified by the land surveyor). The samples will be collected on 10-foot centers. Additionally, four samples will be collected in a 5-foot radius from each original sample. Initially, only the four samples immediately surrounding the original sample location will be analyzed for the COCs associated with that sample. Based on the analytical results of these initial samples, analysis of the remaining samples may be necessary to complete the delineation of COCs. Due to the analytical results of sample 38SS13 located just a few feet southeast of sample 38SS12, samples will not be collected in the southeast corner of the sampling grid at former sample location 38SS12. Two of the previous soil samples, 38SS15 and 38SS16, will be used to delineate the area to the east and west of the grid if necessary for surface soil in the vicinity of 38SS11. Refer to Figures 2-1 and 2-2 for the grid layout for each surface soil sample location.

The samples will be collected from 0 to 2 feet bls using decontaminated stainless steel hand augers. Soil will be placed into stainless steel bowls, thoroughly mixed using stainless steel spoons, and placed in glass jars. Soil samples will be described using the Unified Soil Classification System and recorded in a bound logbook by CH2M HILL Constructors, Inc. (CCI) personnel. All sampling will be conducted in accordance with CH2M HILL's FDEP-approved Comprehensive Quality Assurance Plan (CompQAP), CCI's Basewide Work Plan for NASWF (CCI 1999), FDEP Standard Operating Procedures and the EPA, Region IV Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISOPQAM) dated May 1996.

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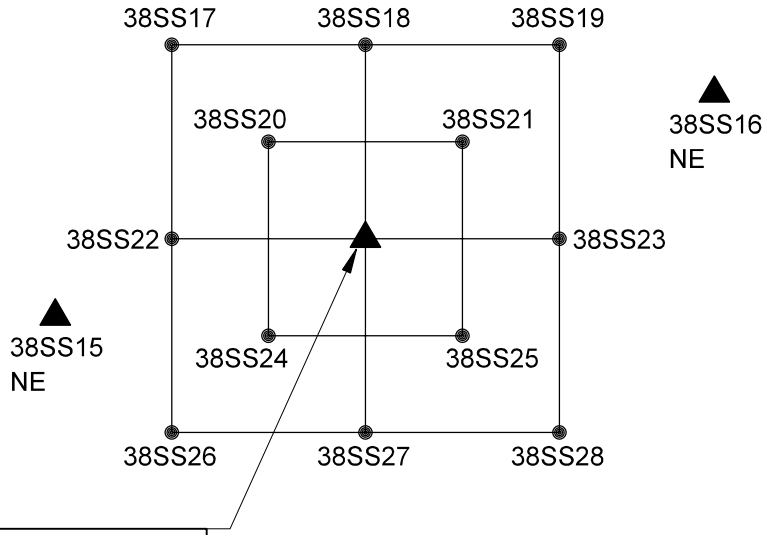
RI surface soil sample and designation	38SS11 ▲
Additional grid surface soil sample and designation	38SS20 ●

Notes:

1. All units are mg/kg.
2. TRPH = Total Recoverable Petroleum Hydrocarbons
3. The applicable residential/industrial soil criteria for Site 38 are:

	EPA PRG	FDEP SCTL	EPA ESV
alpha-Chlordane	1.6/11	3.1/12	NA
gamma-Chlordane	1.6/11	3.1/12	NA
4,4'-DDE	1.7/12	3.3/13	0.0025
4,4'-DDT	1.7/12	3.3/13	0.0025
Heptachlor Epoxide	0.053/0.27	0.1/0.4	NA
TRPH	NA/NA	340/2500	NA

4. PRG = EPA Region IX Preliminary Remedial Goal
5. SCTL = Soil Cleanup Target Level
6. ESV = EPA Region IV Recommended Ecological Screening Value
7. NA = Not Available
8. NE = No exceedance of applicable criteria
9. J = Estimated Value



38SS11 (0-1')	
alpha-Chlordane	5.72 J
gamma-Chlordane	4.55
4,4'-DDE	0.446 J
4,4'-DDT	0.517 J

38SS11D (0-1')	
alpha-Chlordane	5.46 J
gamma-Chlordane	4.26
4,4'-DDE	0.402 J
4,4'-DDT	0.468 J
Heptachlor Epoxide	0.194 J
TRPH	479

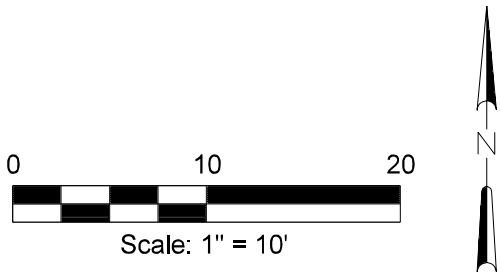


FIGURE 2-1

Surface Soil Sample Grid for 38SS11

Site 38, NAS Whiting Field

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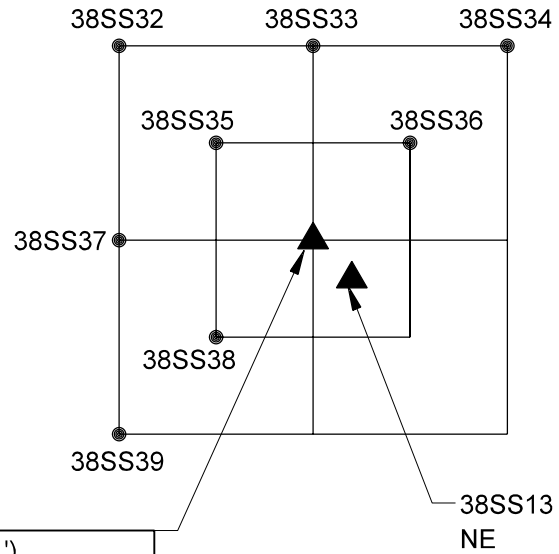
RI surface soil sample and designation	38SS12 ▲
Additional grid surface soil sample and designation	38SS35 ●

Notes:

1. All units are mg/kg.
2. The applicable residential/industrial soil criteria for Site 38 are:

	EPA PRG	FDEP SCTL	EPA ESV
4,4'-DDE	1.7/12	3.3/13	0.0025
4,4'-DDT	1.7/12	3.3/13	0.0025
Dieldrin	0.03/0.15	0.07/0.3	0.0005
Heptachlor Epoxide	0.053/0.27	0.1/0.4	NA

3. PRG = EPA Region IX Prelimianry Remedial Goal
4. SCTL = Soil Cleanup Target Level
5. ESV = EPA Region IV Recommended Ecological Screening Value
6. NE = No exceedance of applicable criteria
7. J = Estimated Value



38SS12 (0-1')	
4,4'-DDE	0.148
4,4'-DDT	0.116 J
Dieldrin	0.035 J
Heptachlor Epoxide	0.097

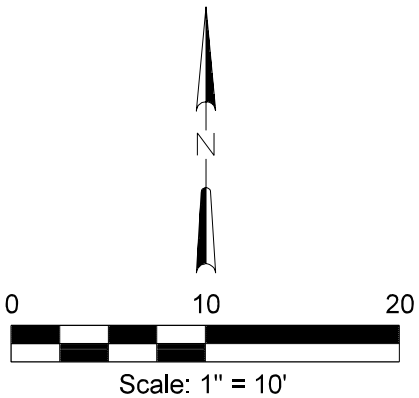


FIGURE 2-2

Surface Soil Sample Grid for 38SS12

Site 38, NAS Whiting Field

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All samples will be shipped to a Navy-approved laboratory for analysis on a 48-hour turnaround time for the 5-foot radius samples and a 14-day turnaround for the remaining samples. Samples will be analyzed for pesticide and TRPH constituents using EPA Method 8081A and Florida Petroleum residual Organic (FL-PRO) method, respectively. Level III Data Quality Objectives will be used for reporting purposes. Sample results will be third party validated. Components of the soil sampling plan are shown in Table 2-1.

TABLE 2-1
Soil Sample Collection and Analysis
Site 38, Whiting Field NAS

RI Sample Location	Station IDs	Strata	EPA Method 8081A	FL-PRO
38SS11	38SS17 through 38SS28	Surface soil	12[a]	12
38SS12	38SS32 through 38SS39	Surface soil	8[b]	
Field Duplicates (10%)	38SS29 – 30	Surface soil	2	2
MS/MSD (5%)	38SS31	Surface soil	1	1
Pre-cleaned Equip Blanks (5%)	PreEB01 – 02		1	1
Field-cleaned Equip Blanks (5%)	PostEB01 – 02		1	1
Estimated No. of samples to be collected:			20 + 5 QA/QC	

Notes: MS/MSD = Matrix Spike/Matrix Spike Duplicate
SS = surface soil
[a] = alpha-Chlordane, gamma-Chlordane and heptachlor epoxide only
[b] = heptachlor epoxide and dieldrin only
Field duplicates and MS/MSD samples will be collected from the 38SS11 sampling grid and analyzed for both pesticides and TRPH

3.0 Reporting Requirements

The results of the soil sampling will be compared to the FDEP SCTLS and EPA Region IX PRGs and summarized in a brief letter report. Based on the results presented in the report, a final action (i.e., hot spot removal) will be determined for the site and an estimated amount of soil to be excavated will be established.

4.0 Works Sited

CH2M HILL, Inc. 1999. *Basewide Health and Safety Plan, Whiting Field, Milton, Florida*.

CH2M HILL, Inc. 1998. *Comprehensive Quality Assurance Plan*.

U.S. Environmental Protection Agency. May 1996. *EPA Region IV Environmental Investigation Standard Operating Procedures and Quality Assurance Manual*.

Tetra Tech NUS, Inc. January 2000. *Remedial Investigation and Feasibility Study Work Plan for Sites 5, 7, 29, 35, 38, 39, 40 and PSC 1485C, Naval Air Station Whiting Field, Milton Florida.*